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II. *A Letter concerning the Electricity of Water, from Mr. Stephen Gray to Cromwell Mortimer, M. D. Secr. R. S.*

S I R,

THE Approbation the former Communication of my Electrical Experiments (*Transact. Numb. 417.*) to the *Royal Society* did meet with, by their most generous Encouragement, hath been a great Inducement to me to go on with them, to see what farther Discoveries I can make upon the Subject of this Species of Attraction. I shall at present communicate only two Experiments; the first shewing that Water may have an Attractive Vertue communicated to it from an Electrick Body; the other, that Water is not only attracted by the Tube, or any other absolutely Electrick Body, but that this Attraction is attended with several remarkable Circumstances.

I. In the former Account of my Experiments, I described the manner of communicating an Attraction to a Bubble of soaped Water; but I have now found, that even *a Body of Water receives an Attractive Vertue, and also a Repelling one, by applying the excited Tube near it, after the same manner as solid Bodies do.* To perform this Experiment, I caused a wooden Dish to be turned, with a Screw-hole at the Bottom, but not so far as to come through the Wood: This was screwed on to the upper End of one of the Stands I have mentioned in the other Experiments, the other Top being taken off: The Dish was about
four

four Inches Diameter, and one Inch deep. Then the Stand was set on a Cake of Rosin, or a Plate of Glass, or the Brims of a Drinking-Glass, or of a Cylindrick one, such as are used for Water Glasses. The Glass must be first warmed, then the Dish being filled with Water, the Tube rubbed, and moved both under the Dish and over the Water three or four times, without touching them. After it has been excited, not only the Dish, but the Water also, becomes Electrical; and if a small Piece of Thread, or a narrow Slip of thin Paper, or a Piece of Sheet-Brass, commonly called Tinsel, be held over the Water in an horizontal Position, within about an Inch or some times more, any of the said Bodies will be attracted to the Surface of the Water, and be repelled, but not so often as by Solids. If a pendulous Thread be held at some Distance from the outside of the Dish, it will be attracted and repelled by it many times together with a very quick Motion, but not at so great a Distance as when the Dish is empty.

II. *An Experiment shewing, that Water is attracted by the Tube, and that the Attraction is attended with several remarkable and surprising Phænomena.*

This Experiment being to be made with small Quantities of Water, I at first made use of some of the Brass Concave little Dishes in which I formerly ground Microscopes; but have since caused to be made a more convenient Apparatus, which consists of a small Pedestal of about four Inches and a half long, the Base of Ivory about two Inches Diameter. Upon the upper End, as in the larger Stand, there is a Screw, upon

on which is screwed on one of the little Dishes, which are made of Ivory : Of these I have several Sizes, from three Quarters to one Tenth of an Inch Diameter. When any one of these little Vessels is filled with Water, so as that it may stand above the Brims of the Cup, and has acquired a Spherical Surface (as it will do in the smallest Cups) let it be set on the Table with the little Stand to which it had before been screwed, or, which is better, upon the larger Stand mentioned above, the great Dish being taken off, and the small plain Top screwed on ; being thus prepared, let the Tube be excited, and held over the Water at the Distance of about an Inch or more. If it be a large Tube, there will first arise a little Mountain of Water from the Top of the Drop, of a conical Form, from the Vertex of which there proceeds a Light (very visible when the Experiment is performed in a dark Room) and a snapping Noise, almost like that when the Fingers are held near the Tube, but not quite so loud, and of a more flat Sound : Upon this immediately the Mountain, if I may so call it, falls into the rest of the Water, and puts it into a tremulous and waving Motion. I have now a few Days since repeated this Experiment in the Day-time, where the Sun shined : I perceived that there were small Particles of Water thrown out of the Top of the Mount, and that sometimes there would arise a very fine Stream of Water from the Vertex of the Cone, in the manner of a Fountain, from which there issued a fine Steam, or Vapour, whose Particles were so small as not to be seen ; yet it is certain that it must be so, since the under Side of the Tube was wet, as I found when I came to rub the Tube again ; and I have since found, that though there does not
always

always arise that Cylinder of Water, yet there is always a Steam of invifible Particles thrown on the Tube, and fometimes to that Degree as to be vifible on it. When fome of the larger Cups are made ufe of, they are to be filled as high as may be without running over: The Surface will be flat about the middle Part, but when the Tube is held over it, the middle Part will be deprefsed into a Concave, and the Parts towards the Edge be raifed ; and when the Tube is held over againft the Side of the Water, the little conical Protuberance of Water iffues out with its Axis horizontally, and after the crackling Noife, returns to the reft of the Water, and fometimes there will be thrown out of it finall Particles of the fame, as from the finaller Portions of Water above mentioned. I am,

S I R,

The Society's, and Your moft

Charter-Houfe,
Jan. 20, 1733 $\frac{1}{2}$.

Obedient Servant,

STEPHEN GRAY.

III. Upon opening the Body of a young Country Girl, dead of a Consumption, I found her Lungs suppurated in many Places, and a *Stricture* in the middle of the Stomach, dividing this *Viscus* into two Bags. This Stricture appeared to have been of some Standing, and likely to have occasioned some Difficulty in Digestion; but upon Enquiry, her Mistress and Fellow Servants said, that her Appetite and Digestions were natural, and that she had continued in a good Plight, till upon coming to *London* she contracted a Cough, that had brought on the Consumption.

F I N I S.

A D D E N D A Page 230.

THE last Experiment was repeated with hot Water; when the Water was attracted much stronger, and at a much greater Distance: The Steam arising from the Vertex was in this Case visible, and the Tube was sprinkled with large Drops of Water. I tried the Experiment in the same Manner upon Quicksilver, which was likewise raised up; but by reason of its great Weight, not to so great an Height as the Water: The snapping Noise was louder, and lasted much longer than in the Water.

L O N D O N:

Printed for W. INNYS, at the West-End of St.
Paul's Church-Yard.

M D C C X X I I.